

Honeybees communicate with each other through an elaborate dance. This dance which tells them where there is a great patch of food, or where might be a good location for a new hive, and then they vote on it! There are many similarities between humans and animals,



## Learning Objectives

Students will learn:

- That bees are an important part of our ecosystem
- How many species of bees there are in the UK
- That bee species differ in their I
- How bees communicate with each other
- How they can help improve the number of bees



## Resources Required

### Resource 1:

Powerpoint

### Resource 2:

resources to make bee bookmarks - see how to sheet

### Resource 3:

Answers for questions are all in the Teacher's Notes



## Key Words

bees, communication, antennae, mandible, stinger, species, pollination, dance, hive, drone, queen



## Learning Outcomes

By the end of the lesson, students will be able to:

- Recognise different species of bees
- Understand how important they are to the world's ecosystem
- help bees survive

## NC Links

Science KS3 PoS:

Interactions and interdependencies: Relationships in an ecosystem

- the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops (Humans depend on pollination more than others considering how we farm crops for large-scale agriculture and consumption)
- the importance of plant reproduction through insect pollination in human food security
- how organisms affect, and are affected by, their environment, including the accumulation of toxic materials.

Identify how people and nature can have conflicting needs - and how we can help as an individual

Climate change, intensive farming and the loss of habitats

Activity	Description	Timings
Introduction	Discuss how much the students know about bees	5 min
What type of bee?	Teach how many native bees we have in the UK, why they are so important to us and the environment	10 mins
Quiz	Quiz: Can they name all the parts of the bee?	5 mins
Anatomy	Teach the students about the different body parts of the bee.	10 mins
How bees communicate	Slide 12: Discuss how they communicate and find a new hive - the danced	5 mins
Make the bee bookmark	Follow the instructions to make the bee and daisy bookmark	10 mins
How can you help? Plenary	Give the students tips on how they can help the bees  Recap main points of the lesson and answer any questions	5 mins

### Key questions:

How many species of bees do we have in the UK?  
 Why are bees important to humans, and the world?  
 What can we do to help them?  
 What are you going to do to help them?

## Plenary/ Assessment of learning



### Assessing Progress

Are the students able to name the parts of a bee?

Can they explain why we are in danger of some bees becoming extinct and can they tell you how they can help the bees.

Can the students describe what will happen to the food chain if we lose bees?

## Extension activities/Homework



Design a garden with flowers, plants and other environmental benefits for bees (include a bee hotel, or make a home under a plant pot for a bee.

Create a poster to encourage people to avoid using pesticides



### Teacher's Notes/Observations

### Additional Information:

We need bees. We may take them and other pollinators like butterflies and hoverflies for granted, but they're vital to stable, healthy food supplies and key to the varied, colourful and nutritious diets we need (and have come to expect).

Bees are perfectly adapted to pollinate, helping plants grow, breed and produce food. They do so by transferring pollen between flowering plants and therefore keeping the cycle of life turning.

The vast majority of plants we need for food rely on pollination, especially by bees: from almonds and vanilla to apples and squash. Bees also pollinate around 80% of wildflowers in Europe, so our countryside would be far less interesting and beautiful without them.

But bees are in trouble. There's growing public and political concern at bee decline across the world. This decline is caused by a combination of stresses – from loss of habitat and food sources to exposure to pesticides and the effects of climate breakdown.

### Slide 4 The Bumblebee

There are 24 different types of bumblebee species found in the UK. Bumblebees are one of the most common insects around. They are found all around the world, with different regions having their own species.

Unfortunately for UK bumblebees, many species have declined in recent years. They are being affected by many issues including chemicals used in gardens and on farms, diseases, and environmental damage.

The buff-tailed bumblebee has a brain the size of a poppy seed. Which is incredible given the fact scientists have managed to train them to score a goal in 'bee football' in return for a sugary treat. Quite unbee-lievable!

### Slide 5 The Mason Bee

They get their name from their habit of building nests out of mud or clay. These remarkable little insects are some of the most interesting and important pollinators around. Mason bees are one of the solitary types of bees.

they like to nest in cavities or holes, so, to attract more of them into your garden, you will need to provide a variety of holes (preferably ranging between 2mm and 10mm) for them. Old fenceposts or other wooden slats are great for this. All you need is a drill and you are good to go!

DIY house for solitary bees: <https://friendsoftheearth.uk/bees/make-a-bee-house>

### Slide 6: The Mining Bee

Also referred to as digger bees are well-named, as they spend much of their time burrowing tunnels in the ground to create their nests. There are 67 types of Mining bee in the UK, and you will see them at different times of the year depending on which flowers they feed from. Spring and early summer is a great time to look for mining bees as most emerge and are active during that time. Only a few species emerge later, the ivy mining bee being one, which comes out at the end of summer/autumn to take advantage of the ivy flowering season.

### Additional Information:

#### Slide 7 The Honeybee:

Probably the best known bee, the honeybee's honey has been used by humans for thousands of years. In the wild they live in wooded areas in large hives made of wax honeycombs and make honey. They use this honey to feed themselves in the winter. Honeybees fly at around 25km an hour!

The queen lays eggs whilst the workers care for the young, almost like a giant bee nursery! Every year a new queen will either take the place of her mother, or she will leave to start a colony of her own. This is one of the areas where bee communication is really important, finding a good place for a new hive, more about that later!

#### Slide 8: Bee anatomy

##### 1. Antennae

A honeybee has two antennae which are bent. They are very sensitive and can pick up the flow of air and temperature which helps the honeybee land safely. They can also taste and smell with the antennae.

##### 2. The honeybee's mouth parts are called the mandible.

The honeybee's mandibles are too small to bite human skin but they can be quite dangerous for other insects that try to invade the hive. They use their mandibles to drink and eat.

3. A honeybee has five eyes. It has two large eyes that are made up of many tiny lenses. We call these large eyes compound eyes. These eyes allow the bee to see movement very well. Honeybees do not see the same colours as we do. They can see ultraviolet light which is impossible for us to see but they can't see red.

A honeybee has three other eyes called ocelli. They are in a triangle shape on the bee's head. They can't see images but they can see light and dark.

4 The body of the honeybee consist of the head, the thorax and the abdomen. The legs all attach to the thorax.

5 The honeybee has two pairs of transparent wings that are attached to its thorax. Honeybees flap their wings very fast, it is almost impossible to see the wings flapping while the bee hovers or flies.

### Additional Information:

6 Honeybees have 6 legs that are attached to the thorax. The hindlegs have pollen baskets on them that the bees stuff full of pollen to take back to the hive. The baskets are transparent (see-through) so when you look at a bee you can see the yellow and orange pollen inside the baskets. The honeybee has a special notch on its front legs that it uses to help keep its antennae clean.

7 A honeybee is the only kind of bee with a barbed (hooked) stinger. This means that it can only sting once and the sting stays behind in the creature that they have stung. Unfortunately, when a honeybee stings, part of its abdomen - the venom sack - is left behind connected to the sting. This means that the honeybee dies. This is why honeybees only sting if they feel they are in a lot of danger and to protect the hive.

If you are ever stung, make sure you scrape the sting out and do not squeeze the venom sack connected to the sting.

Slide 10 Bee communication Information is on powerpoint

Slide 12: Why bees communicate. "To find a new hive, firstly scout bees fly out to look for a prime location. Each one returns to the group and reports its findings by dancing. The other bees watch the scouts dance and then head out to check out the options. They return to the hive and vote for their favourite site by dancing the same dance as the bee that originally found it. The most popular place gets the most bees dancing and that is where the bees will set up their new hives. How clever are they?" page 9, Humanimal by Christopher Lloyd , Illustrated by Mark Ruffle.

Slide 15: You can go as wild as you like with this one! If you have an allotment or garden area, the space for a plant pot or even a window box, you can encourage the children to tend to bee friendly plants. You could make a bee hotel with the class and put it up somewhere safe.

Sharing seeds can be a great way for the children to grow some of the bee friendly plants from seed. Remember - Bees keep the world going around. They play a vital role in growing food and spreading plants. They are nature's pollinators after all. Taking care of bees and working to preserve the British bumblebee populations is about protecting the entire species.

# Bee facts

## Exercise 1 Fill in the missing words in the passage below

Bees are an important part of our ..... along with other insects they ..... about one third of our food. This equates to ..... that insect pollination is worth to ..... crops each year. There are over 250 ..... of bees in the UK. Some of these live in a ..... while other species are classed as ..... bees, who live alone or in small groups. Bees are under great threat, but we can help them by ..... bee friendly plants or ..... You can ..... a bee hotel, or not use ..... in your garden.

**Word list:** pesticides, hive, ecosystem, species, planting, £690 million, seeds, United Kingdom (UK), solitary, build, pollinate

## Exercise 2. TRUE or FALSE?

What can you remember about bees?

	True	False
Bee numbers are on the decline worldwide		
There are 29 types of bumblebee in the UK		
Bees are affected by the varroa mite		
One person can't help the bee population		
Chive flowers are bee friendly		

# Bee facts

## Answer Sheet

### Exercise 1 Fill in the missing words in the passage below

Bees are an important part of our **ECOSYSTEM**, along with other insects they **POLLINATE** about one third of our food. This equates to **£690 MILLION** that insect pollination is worth to **UK** crops each year.

There are over 250 **SPECIES** of bees in the UK. Some of these live in a **HIVE** while other species are classed as **SOLITARY** bees, who live alone or in small groups.

Bees are under great threat, but we can help them by **PLANTING** bee friendly plants or **SEEDS**. You can **BUILD** a bee hotel, or not use **PESTICIDES** in your garden.

Word list: pesticides, hive, ecosystem, species, planting, £690 million, seeds, United Kingdom (UK), solitary, build, pollinate

### Exercise 2. TRUE OR FALSE?

What can you remember about bees?

	True	False
Bee numbers are on the decline worldwide	X	
There are 29 types of bumblebees in the UK		X
bees are affected by the varroa mite	X	
one person can't help the bee population		X
chive flowers are bee friendly	X	



# Have fun making a bee bookmark

## What you will need

- One piece of card, for the bookmark, 16cm long, 4cm wide
- Two card circles, black, 2cm diameter
- Two card circles, yellow, 2cm in diameter
- Two semicircles for the wings
- Two small black strips of card 2cm by 1/2 cm
- One small black triangle 1 cm long
- PVA glue
- Black pen



## How to make your bee bookmark

1. Cut out all the parts required for your bookmark.
2. Glue the black triangle (the stinger) onto the back of one black circle then stick this onto the bookmark.
3. Overlay a yellow circle and glue in place.
4. Stick the wings on just above the yellow circle.
5. Then overlay and glue the black circle over the yellow circle.
6. Glue the black antennae onto the back of the remaining yellow circle and draw on the face.
7. Glue the head on top of the black circle.
8. Design and draw the flower and stick it on your bee bookmark.

You could write on your bookmark what you are going to do to help bees.